

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant: Garry Brereton
Serial No.: 10/538,816
Filed: January 17, 2006
Group Art Unit: 3616
Examiner: Wilhelm, Timothy
Title: SUSPENSION TRAILING ARM

Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

APPEAL BRIEF

Dear Sir:

Subsequent to the filing of the Notice of Appeal on August 3, 2010, Appellant hereby submits its brief. The Commissioner is authorized to charge the amount of \$540.00 and any additional fees or credit any overpayment to Deposit Account No. 50-1482, in the name of Carlson, Gaskey & Olds, P.C.

REAL PARTY IN INTEREST

The real party in interest is Meritor Heavy Vehicle Systems Limited, the assignee of the entire right and interest in this Application.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 3, 8-13, 40 and 42-53 are pending in this application. Claims 3, 8-13, 40 and 42-53 stand finally rejected under 103(a). The rejection of claims 3, 8-13, 40 and 42-53 is being appealed.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

This invention relates to a suspension trailing arm 332, 732 for suspending a heavy vehicle chassis 25 from a beam-type axle 42 (page 5, line 2 to 5). The suspension trailing arm 332, 732 includes a chassis mounting formation 346, 746, a first cast or forged component 352, 752 and a second component 354, 734. The first cast or forged component 352, 752 includes a first portion 356a, 756a of an axle locating formation 356, 756, and an arm portion being an integral casting or forging with the axle locating formation and extending between the first portion 356a, 756a of the axle locating formation 356, 756 and the chassis mounting formation 346, 746. The second component 354, 734 includes a second portion 356b, 756b of the axle locating formation 356, 756 and a bracket 350, 750 for mounting a spring. The first portion 356a, 756a and the second portion 356b, 756b of the axle locating formation 356, 756 mate together to fully encircle a portion of a beam-type axle 42 (page 7, lines 1 to 26).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

- A. Are Claims 8, 12, 13 and 42-48 properly rejected under 35 U.S.C. 103(a) based on Smith et al. (US 6491314) in view of Pierce (US 5203585)?
- B. Are Claims 9, 14, 15, 49 and 50 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. in view of and Chalin et al. (US 7007960)?
- C. Are Claims 3, 10, 11 and 40 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. in view of Pierce?
- D. Are Claims 51-53 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. in view of Pierce, Chalin et al. and Pierce et al. (US 2001-00202775)?

ARGUMENTS

A. Obviousness of Claims 8, 12, 13 and 42-48 based on Smith et al. in view of Pierce.

Claims 8, 12 and 42-48

The Examiner states that Smith et al. does not disclose a trailing arm that is cast or forged. The Examiner states that Pierce discloses this feature, and it would be obvious to modify the trailing arm of Smith et al. to be either cast or forged to ensure a high strength of the trailing arm. Appellant respectfully disagrees.

The claimed invention is not obvious. In Smith et al., the Examiner refers to the embodiment of Figures 42 to 52. Smith et al. discloses a fabricated box-section arm or beam 518 including a sleeve 542 formed from fabricated plates at its rear. An elastomeric sheet 588 is provided between the axle 524 and the sleeve 542. Beam-axle connectors 564 are bolted to both sides of the beam 518 with a bolt 582. Each connector 564 includes a wrapper band 566 formed from two fabricated plates 568 and 572 welded together around the axle, with direct contact with the axle to frictionally hold the axle 524 in place. There is no direct welding (column 20, lines 16-18, 43-60). A fabricated beam extension 519 extends rearwards to support the air spring. Smith et al. does not disclose a first component that is a cast or forged component including an arm portion integral with an axle locating portion and extending between the axle locating formation and a chassis mounting formation as claimed. In Smith et al., the beam 518 provides this feature.

Pierce discloses a cast or forged first member 46 with an I-section/"dog bone" section (column 3, lines 20-30). A separate axle bracket assembly 24 with arms 64 connects the axle to the arm. The axle bracket assembly does not fully encircle the axle. The member 46 does not encircle the axle.

Neither document discloses a suspension trailing arm including a first cast or forged component including an arm portion being an integral casting or forging with an axle locating formation and extending between a first portion of the axle locating formation and a chassis mounting formation, and therefore claimed invention is not obvious.

Additionally, there is no motivation to combine the references as both references focus on providing a degree of relative movement between an arm and an axle, but offer different ways of

achieving this. In Smith et al., this is provided by the rubber bushings 560 and 588. In Pierce, the ability of the assembly to pivot about a bolt 60 appears to provide fore-aft compliance, and the rubber bush provide compliance in other directions. Thus, the skilled person would have no reason to combine the two documents and there would be a significant practical physical barrier in combining the documents given the different constructions of the two arms. The claimed invention is not obvious, and Appellant respectfully requests reversal of the rejection.

Claim 13

The rejection of claim 13 is separately contested from the rejection of claims 43 et al. Claim 13 recites that the cast or forged suspension trailing arm includes at least one of a recess portion, a concave portion, and a convex portion to facilitate fitment of one additional suspension component and a braking component near the cast or forged suspension trailing arm. Neither reference discloses these features, and the claimed invention is not obvious.

B. Obviousness of Claims 9, 14, 15, 49 and 50 based on Smith et al. in view of Pierce and Chalin et al.

Claims 9, 14, 15, 49 and 50

Claims 9, 14, 15, 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. in view of Pierce and Chalin et al. (US 7007960). Claims 14 and 15 were cancelled in the response filed January 20, 2010.

Claims 9, 49 and 50 recite that the first portion of the axle locating formation includes a window aperture having a peripheral edge. Chalin et al. discloses a fabricated arm with a fabricated “sleeve” 32. The sleeve 32 is inherently flexible to enable it to be clamped to the axle (column 3, lines 24-25). The sleeve 32 is welded to the axle before it is welded to the arm (column 4, lines 1-12). The construction of Chalin et al. is incompatible with the construction of Smith et al. or Pierce. In Smith et al., window welds are incompatible with the construction as welding would damage the rubber sheet 588 due to the heat generated. In Pierce, an entirely different trailing arm construction is disclosed in which a separate “depending arm” 64 is welded from underneath to approximately

half the axle 22. Thus, the skilled person would not be motivated to employ a window aperture in these constructions and would have considerable practical difficulties in doing so.

C. Obviousness of Claims 3, 10, 11 and 40 based on Smith et al. and Pierce.

Claims 10 and 11

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. in view of Pierce. Neither reference discloses a variable bending strength as claimed. The Examiner states that it would be obvious to make a bending strength of a trailing arm greater in certain areas as it has been held that discovering the optimum or workable ranges involves only routine skill in the art. However, the Examiner provided no evidence of this assertion. Additionally, the claims depend on patentable independent claim 43 and are allowable for the reasons set forth above.

Claims 3 and 40

Claims 3 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. in view of Pierce. Neither reference discloses a thickness of a suspension trailing arm as claimed. The Examiner states that it would be obvious to make a thickness of a trailing arm greater in certain areas as it has been held that discovering the optimum or workable ranges involves only routine skill in the art. However, the Examiner provided no evidence of this assertion. Additionally, the claims depend on patentable independent claim 43 and are allowable for the reasons set forth above.

D. Obviousness of Claims 51-53 based on Smith et al. in view of Pierce, Chalin et al., and Pierce et al. (Pierce '775).

Claims 51-53

Claims 51 to 53 are rejected as being obvious over Smith et al. in view of Pierce, Chalin et al., and Pierce et al (Pierce '775). Claims 51 to 53 recite that the first portion of an axle locating feature is constituted by a cast or forged wall configured to extend further inboard than the chassis mounting formation.

Figures 5 and 18 of Pierce et al. '775 relate to a fabricated (that is, not a cast or forged) trailing arm, in which the wider axle locating formation is formed from a bent sheet metal plate 43, 43" that is an extension of the lower surface of the trailing arm. The plate only extends around the upper half of the axle. It would not be practical to modify the constructions of the other three documents in view of Pierce et al. '775 because of the differences in the constructions disclosed in the documents. In Smith et al., the bent plate is incompatible with the arcuate plates and beam-axle connectors 564. In Pierce, the plate would not function with the trailing arm and depending arm construction. In Chalin et al., the trailing arm 14 is formed from an inverted 'U'-shaped panel which encircles the axle and therefore could not be extended inboard by following the teaching of Pierce et al. '775.

Also, as the combination requires four documents to reject claims 51-53, also indicating that the claims are non-obvious.

CONCLUSION

For the reasons set forth above, the rejection of all claims is improper and should be reversed. Appellant respectfully requests such an action.

Respectfully Submitted,

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Serial No. 10/538,816
60130-2474

CLAIM APPENDIX

3. The suspension trailing arm according to Claim 43 wherein a thickness of the cast or forged suspension trailing arm above the axle locating formation is less than 50 mm.
8. The suspension trailing arm according to Claim 43 further including a chassis mounting formation, wherein a section of the cast or forged suspension trailing arm between the chassis mounting formation and the axle locating formation has one of a substantially I-shaped profile and a substantially C-shaped profile and includes a first flange and a second flange spaced by a web.
9. The suspension trailing arm according to Claim 49 wherein the window aperture is located near the web and inboard of the web.
10. The suspension trailing arm according to Claim 8 wherein a bending strength of the one of the substantially I-shaped profile and the substantially C-shaped profile is greater near the axle locating formation than near the chassis mounting formation.
11. The suspension trailing arm according to Claim 10 wherein at least one of a flange thickness, a web thickness, a flange width and a web depth of the cast or forged suspension trailing arm is different near the axle locating formation with respect to the chassis mounting formation to achieve a difference in the bending strength.
12. The suspension trailing arm according to Claim 43 including an integral damper mounting formation for one of a suspension damper and a shock absorber.
13. The suspension trailing arm according to Claim 43 wherein the cast or forged suspension trailing arm includes at least one of a recessed portion, a concave portion, and a convex portion to facilitate fitment of one of an additional suspension component and a braking component near the cast or forged suspension trailing arm.

40. The suspension trailing arm according to Claim 3 wherein the thickness is less than 30 mm.
42. The suspension trailing arm according to Claim 8 wherein the one of a substantially I- or C-section profile is defined by a cross-section taken transverse to a longitudinal axis of the cast or forged suspension trailing arm.
43. A suspension trailing arm for suspending a heavy vehicle chassis from a beam-type axle, the suspension trailing arm comprising:
 - a chassis mounting formation;
 - a first cast or forged component including a first portion of an axle locating formation, and an arm portion being an integral casting or forging with the axle locating formation and extending between the first portion of the axle locating formation and the chassis mounting formation; and
 - a second component comprising a second portion of the axle locating formation and a bracket for mounting a spring;wherein the first portion and the second portion of the axle locating formation mate together to fully encircle a portion of a beam-type axle.
44. The suspension trailing arm according to Claim 43 wherein the second component is a cast or forged component.
45. The suspension trailing arm according to Claim 43 wherein the first component includes the chassis mounting formation that is integral with the arm portion.
46. The suspension trailing arm according to Claim 43 wherein the first portion and the second portion of the axle locating formation are each arranged to encircle substantially half of the beam-type axle.

47. The suspension trailing arm according to Claim 43 wherein the first portion and the second portion of the axle locating formation mate together at corresponding edges above and below the beam-type axle.

48. The suspension trailing arm according to Claim 47 wherein the suspension trailing arm includes welds connecting the corresponding edges above and below the beam-type axle.

49. The suspension trailing arm according to Claim 43 wherein the first portion of the axle locating formation includes a window aperture having a peripheral edge.

50. The suspension trailing arm according to Claim 49 including a beam-type axle, wherein a weld extending around a portion of the peripheral edge of the window aperture connects the beam-type axle to the axle locating formation.

51. The suspension trailing arm according to Claim 43, wherein the first portion of the axle locating feature is constituted by a cast or forged wall, the cast or forged wall being configured to extend further inboard than the chassis mounting formation.

52. The suspension trailing arm according to Claim 51, wherein the arm portion curves inboard to provide a smooth transition into the cast or forged wall.

53. The suspension trailing arm according to Claim 51, wherein a window is provided in the cast or forged wall, and the window extends further inboard than the chassis mounting formation.

Serial No. 10/538,816
60130-2474

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None